

§ 63.8232 What test methods and other procedures must I use to demonstrate initial compliance with the emission limits?

You must conduct a performance test for each by-product hydrogen stream, end box ventilation system vent, and mercury thermal recovery unit vent according to the requirements in § 63.7(e)(1) and the conditions detailed in paragraphs (a) through (d) of this section.

(a) You may not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in § 63.7(e)(1).

(b) For each performance test, you must develop a site-specific test plan in accordance with § 63.7(c)(2).

(c) You must conduct at least three test runs to comprise a performance test, as specified in § 63.7(e)(3) and in either paragraph (c)(1) or (2) of this section.

(1) The sampling time and sampling volume for each run must be at least 2 hours and 1.70 dry standard cubic meters (dscm). Mercury results below the analytical laboratory's detection limit must be reported using the reported analytical detection limit to calculate the sample concentration value and, in turn, the emission rate in the units of the standard; or

(2) The sampling time for each test run must be at least 2 hours and the mercury concentration in each field sample analyzed must be at least two times the reported analytical detection limit.

(d) You must use the test methods specified in paragraphs (d)(1) through (4) of this section and the applicable test methods in paragraphs (d)(5) through (7) of this section.

(1) Method 1 or 1A in appendix A of 40 CFR part 60 to determine the sampling port locations and the location and required number of sampling traverse points.

(2) Method 2, 2A, 2C, or 2D in appendix A of 40 CFR part 60 to determine the stack gas velocity and volumetric flow rate.

(3) Method 3, 3A, or 3B in appendix A of 40 CFR part 60 to determine the stack gas molecular weight.

(4) Method 4 in appendix A of 40 CFR part 60 to determine the stack gas moisture content.

(5) For each by-product hydrogen stream, Method 102 in appendix A of 40 CFR part 61 to measure the mercury emission rate after the last control device.

(6) For each end box ventilation system vent, Method 101 or 101A in appendix A of 40 CFR part 61 to measure the mercury emission rate after the last control device.

(7) For each mercury thermal recovery unit vent, Method 101 or 101A in appendix A of 40 CFR part 61 to measure the mercury emission rate after the last control device.

(e) During each test run for a by-product hydrogen stream and each test run for an end box ventilation system vent, you must continuously measure the electric current through the operating mercury cells and record a measurement at least once every 15 minutes.

(f) If the final control device is not a nonregenerable carbon adsorber and if you are demonstrating compliance using periodic monitoring under § 63.8240(b), you must continuously monitor the parameters listed in paragraph (f)(1) of this section and establish your maximum or minimum monitoring value (as appropriate for your control device) using the requirements in paragraph (f)(2) of this section.

(1) During the performance test specified in paragraphs (a) through (d) of this section, you must continuously monitor the control device parameters in paragraphs (f)(1)(i) through (vii) of this section and record a measurement at least once every 15 minutes.

(i) The exit gas temperature from uncontrolled streams;

(ii) The outlet temperature of the gas stream for the final (*i.e.*, the farthest downstream) cooling system when no control devices other than coolers or demisters are used;

(iii) The outlet temperature of the gas stream from the final cooling system when the cooling system is followed by a molecular sieve or regenerative carbon adsorber;

(iv) Outlet concentration of available chlorine, pH, liquid flow rate, and inlet

gas temperature of chlorinated brine scrubbers and hypochlorite scrubbers;

(v) The liquid flow rate and exit gas temperature for water scrubbers;

(vi) The inlet gas temperature of regenerative carbon adsorption systems; and

(vii) The temperature during the heating phase of the regeneration cycle for carbon adsorbers or molecular sieves.

(2) To establish a maximum monitoring value or minimum monitoring value, as appropriate for your final control device, you must average the recorded parameters in paragraphs (f)(1)(i) through (vi) of this section over the test period. If your final control device is a regenerative carbon adsorber, you must use the highest temperature reading measured in paragraph (f)(1)(vii) as the reference temperature in § 63.8244(b)(2)(v).

§ 63.8234 What equations and procedures must I use for the initial compliance demonstration?

(a) *By-product hydrogen streams and end box ventilation system vents.* You must determine the total grams of mercury per Megagram of chlorine production (g Hg/Mg Cl₂) of chlorine produced from all by-product hydrogen streams and all end box ventilation system vents, if applicable, at a mercury cell chlor-alkali production facility, and you must follow the procedures

in paragraphs (a)(1) through (6) of this section.

(1) Determine the mercury emission rate for each test run in grams per day for each by-product hydrogen stream and for each end box ventilation system vent, if applicable, from Method 101, 101A, or 102 (40 CFR part 61, appendix A).

(2) Calculate the average measured electric current through the operating mercury cells during each test run for each by-product hydrogen stream and for each end box ventilation system vent, if applicable, using Equation 1 of this section as follows:

$$CL_{avg, run} = \frac{\sum_{i=1}^n CL_{i, run}}{n} \quad (\text{Eq. 1})$$

Where:

CL_{avg, run} = Average measured cell line current load during the test run, amperes;

CL_{i, run} = Individual cell line current load measurement (*i.e.*, 15 minute reading) during the test run, amperes; and

n = Number of cell line current load measurements taken over the duration of the test run.

(3) Calculate the amount of chlorine produced during each test run for each by-product hydrogen stream and for each end box ventilation system vent, if applicable, using Equation 2 of this section as follows:

$$P_{Cl_2, run} = (1.3 \times 10^{-6}) (CL_{avg, run}) (n_{cells, run}) (t_{run}) \quad (\text{Eq. 2})$$

Where:

P_{Cl₂, run} = Amount of chlorine produced during the test run, megagrams chlorine (Mg Cl₂);

1.3 × 10⁻⁶ = Theoretical chlorine production rate factor, Mg Cl₂ per hour per ampere per cell;

CL_{avg, run} = Average measured cell line current load during test run, amperes, calculated using Equation 1 of this section;

n_{cell, run} = Number of cells on-line during the test run; and

t_{run} = Duration of test run, hours.

(4) Calculate the mercury emission rate in grams of mercury per megagram of chlorine produced for each test run for each by-product hydrogen stream and for each end box ventilation system vent, if applicable, using Equation 3 of this section as follows:

drogen stream and for each end box ventilation system vent, if applicable, using Equation 3 of this section as follows:

$$E_{Hg, run} = \left[\frac{(R_{run})(t_{run})}{(24)(P_{Cl_2, run})} \right] \quad (\text{Eq. 3})$$

Where:

E_{Hg, run} = Mercury emission rate for the test run, g Hg/Mg Cl₂;

R_{run} = Measured mercury emission rate for the test run from paragraph (a)(1) of this section, grams Hg per day;

t_{run} = Duration of test run, hours;